

REMARKS

This Amendment responds to the final Office Action mailed January 25, 2007 and is being enclosed with a Request for Continued Examination submitted concurrently herewith. This Amendment represents a submission fully responsive to the final Office Action mailed on January 25, 2007, as required under 37 CFR § 1.114. Claims 1-17 are pending. Claims 1, 15, and 17 have been amended. In view of the foregoing amendments, as well as the following remarks, Applicants respectfully submit that this application is in complete condition for allowance and request reconsideration of the application in this regard.

Rejection of Claims Under 35 U.S.C. § 102

Claims 1-3, 5, and 8-10 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,891,350 to Shan et al. (hereinafter *Shan*). Of the rejected claims, claim 1 is the only independent claim. The Examiner contends that *Shan* shows or teaches all the elements of the rejected claims. Applicants respectfully disagree with the Examiner's contention for the reasons set forth below.

Shan fails to disclose or suggest "a second electrode having a parallel plate arrangement with said first electrode" and a separating ring "defining a sidewall between said first electrode and said second electrode" in which the separating ring comprises "a dielectric material for electrically isolating said first electrode from said second electrode," as set forth in Applicants' amended independent claim 1. The Examiner contends on page 2 of the Office Action that *Shan* discloses a first electrode (30), a second electrode (24), and "a separating ring (76; Figure 3; column 9; lines 31-37)." However, *Shan* fails to disclose that the separating ring (76) defines a sidewall that separates the first and second electrodes (24, 30). Instead, the side portion (20) of the chamber defines the sidewall between the first and second electrodes (24, 30).

The Examiner contends that the disclosure at column 7, lines 7-15 of *Shan* pertains to the feature labeled with reference numeral 76. However, Applicants note that the disclosure at column 7, lines 7-15 pertains instead to a capacitor in the equivalent circuit shown in Figure 2 of *Shan*. The disclosure at column 7, lines 7-15 does not pertain to the structure shown in Figure 3 of *Shan*. Clarification is requested.

In order for a reference to anticipate the invention in a claim, the reference must teach each and every element in the precise arrangement set forth in the claim. If the reference

fails to teach even one of the claimed elements, the reference does not and cannot anticipate the claimed invention. Because of the deficiencies discussed above, *Shan* fails to anticipate independent claim 1. For at least this reason, Applicants respectfully request that this rejection be withdrawn.

Because claims 2, 3, 5, and 8-10 depend from independent claim 1, Applicants submit that these claims are also patentable for at least the same reasons discussed above. Furthermore, these claims recite unique combinations of elements not taught, disclosed or suggested by *Shan*.

Rejection of Claims Under 35 U.S.C. § 103

Claims 15-17 over Shan in view of Suntola and Maher

Claims 15-17 stand rejected under 35 U.S.C. § 103(a) as unpatentable over *Shan* in view of U.S. Patent No. 5,711,811 to Suntola et al. (hereinafter *Suntola*) and U.S. Patent No. 54,381,965 to Maher, Jr., et al. (hereinafter *Maher*). Of these claims, claim 15 is independent. Applicants respectfully disagree with the rejection for the reasons set forth in the following remarks.

Applicants submit that there is no suggestion or motivation to modify *Shan* based upon the disclosure in *Suntola* to process multiple substrates, as contended by the Examiner. Specifically, *Suntola* is directed to a system for depositing thin films by vapor phase deposition in a non-plasma atomic layer epitaxy (ALE) process. To process multiple substrates, *Suntola* stacks the substrates in multiple chambers (38) defined by a stack of planar elements (32). However, *Suntola* fails to disclose how the stacked planar elements (32) could somehow be modified to permit the processing of multiple substrates in the plasma deposition system of *Shan*. For example, *Suntola* fails to disclose or suggest how a person having ordinary skill in the art would couple the planar elements (32) in *Suntola* with a power supply, such as power supply (60) in *Shan*, in order to generate a plasma inside the chambers (38). As another example, *Suntola* fails to disclose or suggest any type of electrical isolation between the planar elements (32) or how a person having ordinary skill in the art would modify the stack of planar elements (32) to include electrical isolation required for use in the plasma processing system of *Shan*.

Accordingly, a person having ordinary skill in the art would not have been motivated to modify *Shan* in the manner suggested by the Examiner based upon the disclosure in

Suntola. For at least this reason, Applicants submit that the Examiner has failed to establish *prima facie* obviousness. Therefore, Applicants request that the rejection of independent claim 15 be withdrawn.

Moreover, the proposed modification would have rendered the plasma-processing apparatus of *Shan* unsuitable for its intended purpose and would also have changed the principle of operation of *Shan*, which are prohibited under MPEP § 2143.01. Specifically, the proposed modification would eliminate the electrodes (24, 30) coupled with power supply (60) in *Shan* and, in their place, would substitute a stack of planar elements (32) coupled with a precursor source, as taught by *Suntola*. The planar elements (32) in *Suntola* are not electrically isolated, are not capable of being coupled with a power supply to generate a plasma in chambers (38), and are not used to perform a plasma process. Hence, the principle of operation would change from a plasma deposition process to a non-plasma deposition process. The proposed modification to *Shan* would have rendered the plasma processing system unsuitable for its intended purpose by converting it to a non-plasma processing system. For at least these additional reasons, Applicants submit that the Examiner has failed to establish *prima facie* obviousness. Therefore, Applicants request that the rejection of independent claim 15 be withdrawn.

Applicants further submit that there would have been no suggestion or motivation to modify the combination *Shan* and *Suntola* based upon the disclosure in the secondary reference *Maier*. Specifically, *Maier* teaches that if multiple electrodes are present for processing multiple substrates, then those electrodes must be situated inside “a known bell-jar type of vacuum chamber (not shown).” See column 4, lines 7-10. Hence, a person having ordinary skill in the art would be motivated to modify *Shan* such that the electrodes (24, 32) are themselves placed inside of another vacuum chamber. Furthermore, *Maier* teaches that if multiple electrodes (19-25) are present for processing multiple substrates, then adjacent electrodes are supported by uprights (34-37). See column 5, lines 42-47. Although formed from a dielectric material, these uprights (34-37) do not form a vacuum-tight seal with the electrodes (19-25) as the Examiner alleges that item 76 does in *Shan*. Hence, a person having ordinary skill in the art would be motivated to modify *Shan* to eliminate the vacuum-tight seal that item (76) allegedly provides with the electrodes (24, 30) so that multiple electrodes can be supported on stilt-like uprights inside a vacuum chamber. As a result, the electrodes (24, 30) in *Shan* would no longer form part of the vacuum vessel. To reiterate, the type of electrode arrangement

disclosed in *Maher* is amenable to electrodes placed inside of a bell jar as taught by *Maher*, but not to an electrode arrangement in which at least the electrodes form part of the vacuum vessel, as disclosed in *Shan*.

A person having ordinary skill in the art would not have modified the combined disclosures of *Shan* and *Suntola* in this manner. For at least these reasons, Applicants submit that the Examiner has failed to establish *prima facie* obviousness. Therefore, Applicants request that the Examiner withdraw the rejection of independent claim 15.

Moreover, the proposed modification would have rendered the plasma deposition system of *Shan* unsuitable for its intended purpose and would have changed its principle of operation, which are not permitted under MPEP § 2143.01. As modified by the teachings of *Maher*, the electrodes (24, 30) in *Shan* would have been placed inside of a vacuum chamber and would have been supported on uprights inside the vacuum chamber, which would defeat the intended purpose of having the electrodes (24, 30) function as part of the vacuum vessel and eliminate the necessity for the separating ring (76) in *Shan*. The proposed modification to the combination of *Shan* and *Suntola* would also convert the plasma deposition system in *Shan* to a plasma etching system, as taught by *Maher*. Plasma deposition and etching systems have very different principles of operation. For at least this additional reason, Applicants submit that the Examiner has failed to establish *prima facie* obviousness. Therefore, Applicants request that the rejection of independent claim 15 be withdrawn.

Applicants also disagree with the Examiner's motivations to combine *Maher* with *Suntola* and *Shan*. The Examiner states in text on page 8 of the Office action that "[m]otivation to add Suntola's apparatus (Figure 3) with Maher's plasma generating means to Shan's apparatus includes, among plural motivations, for plasma processing as taught in Suntola (column 1; lines 42-44), and for processing plural substrates for greater through-put compares to Shan as taught by Suntola." Applicants fail to understand how adding "Suntola's apparatus ... with Maher's plasma generating means," to *Shan* is somehow motivated by "plasma processing as taught by Suntola" or "processing plural substrates for greater throughput compared to Shan as taught by Suntola", as alleged by the Examiner.

With regard to the former alleged motivation, the element or limitation of "Maher's plasma generating means" is not claimed subject matter set forth in independent claim 15. Consequently, the Examiner is setting forth a motivation to modify *Shan* to include a

feature, namely “Maher’s plasma generating means,” that is not claimed subject matter set forth in independent claim 15. Furthermore, the element or limitation of “Suntola’s apparatus” is not claimed subject matter in independent claim 15. Consequently, the Examiner is setting forth an improper motivation to modify *Shan* to include features, namely “Maher’s plasma generating means” and “Suntola’s apparatus,” that are not claimed subject matter set forth in independent claim 15.

Applicants further note that the passage in *Suntola* relied upon by the Examiner at column 1, lines 42-44 pertains generally to molecular beam epitaxy (MBE) and chemical vapor deposition (CVD). However, the generalities in this passage in the Background section of *Suntola* fail to disclose with any particularity how a person having ordinary skill in the art would modify the stacked planar elements (32) in *Suntola* to permit use in the plasma processing of *Shan*. *Suntola* also fails to disclose that the stacked planar elements (32) are even heated.

For at least this additional reason, Applicants submit that the Examiner has failed to establish *prima facie* obviousness. Therefore, Applicants request that the Examiner withdraw the rejection of independent claim 15.

Because claims 16 and 17 depend from independent claim 15, Applicants submit that these claims are also patentable for at least the same reasons discussed above. Furthermore, these claims recite unique combinations of elements not disclosed or suggested by the combined disclosures of *Shan*, *Suntola* and *Maher*.

Claims 4, 6, 7, and 11-14 over *Shan* in view of *Suntola* and *Maher*

Claims 4, 6, 7, and 11-14 stand rejected under 35 U.S.C. § 103(a) as unpatentable over *Shan* in view of U.S. Patent No. 6,700,079 to Hirooka (hereinafter *Hirooka*). *Hirooka* fails to remedy the deficiencies of *Shan*. Because these claims 10-13, 15, and 16 depend from independent claim 1, Applicants submit that these claims are also patentable for at least the same reasons as independent claim 1. Furthermore, each of claims 4, 6, 7, and 11-14 recites a unique combination of elements not disclosed or suggested by *Shan* in view of *Hirooka*.

Comments on Examiner’s Response to Arguments

Applicants note that, on page 12 of the Office Action, “the Examiner employs (*sic*) Applicant to read the Examiner’s element-by-element equivalence of each and every

claimed structure required by Applicant's claimed (*sic*). Specifically, when the Examiner does not recite a specific equivalence (*sic*) from the prior art, Applicant is safe to assume that the reference in question does not teach the claimed apparatus part. In the case of claim 15, for example, a cursory review of the Examiner's element-by-element equivalence of each and every claimed structure required by Applicant's claim 15 details both elements taught by Shan (in parenthesis (*sic*)) and elements not taught by Shan (absent parenthesis (*sic*)). Specifically (*sic*), Shan only does not teach that which the Examiner did not apply an art-based equivalence – 'said third electrode'." The Examiner continues "[I]n this case, the Examiner has indeed identified (*sic*) in the prior art the fact that there is motivation to add Suntola's apparatus (Figure 3) with Maher's plasma generating means to Shan's apparatus for plasma processing as taught by Suntola (column 1; lines 42-44), and for processing plural substrates for greater through-put compared to Shan as taught by Suntola."

Applicants' representative appreciates the particularity of the Examiner's rejection under 35 U.S.C. § 102. However, Applicants' representative found it rather difficult to interpret the rejections under 35 U.S.C. § 103(a) posed in the Office Action for purposes of determining the differences between the claim and the references. The lack of clarity represented a hurdle for the Applicants in responding to the rejections in this Office Action response and the prior Office Action response. MPEP § 706.02(j) requires the Examiner to state the **difference or differences** in the claim over the applied reference(s) and the **proposed modification** of the applied reference(s) necessary to arrive at the **claimed subject matter**. Only with the benefit of the explanation given above for claim 15 was Applicants' representative able to discern the differences and proposed modification. The difficulty is better explained in the following remarks.

With regard to claim 15 and on pages 5 and 6 of the Office Action, the Examiner reproduces the entire text of claim 15 with annotations in parentheses to disclosure identified by the Examiner in *Shan*. Applicants understand the origins of the annotations in the passage. However, the Examiner never clearly states what *Shan* does not teach. Instead, it appears on its face that *Shan* teaches every claimed element. Applicants note that the Examiner failed to explain in the August 16, 2006 Office Action that items that lacked an annotation in parentheses were not considered by the Examiner to be present in *Shan*. Even if this explanation would have been provided in the August 16, 2006 Office Action, Applicants' representative believes that it

would have been difficult to detect the differences that the Examiner believes exists between claim 15 and *Shan*.

A paragraph following the paragraph spanning pages 5 and 6 of the Office Action clearing stating what *Shan* fails to teach would aid the Applicants to readily understand differences that the Examiner believes exist between claim 15 and the disclosure in *Shan*.

In a paragraph spanning pages 7 and 8 of the Office Action, the Examiner reproduces a portion of claim 15 and alleges that this paragraph represents what “*Suntola* teaches.” Applicants cannot find the term “third electrode” or, for that matter, even the word “electrode” in the paragraph spanning pages 7 and 8 of the Office Action. Instead, all occurrences of the word “electrode” are replaced with the word “chamber” in the paragraph spanning pages 7 and 8. Carefully reading the Examiner’s words in the paragraph spanning pages 7 and 8 of the Office Action would not indicate to any reasonable reader that the modification to *Shan* that was suggested based on the disclosure in *Suntola*. So, without the benefit of the Examiner’s statements on page 8 of the Office Action, Applicants would have difficulty in understanding that the Examiner is using *Suntola* as a teaching of “processing plural substrates for greater through-put” and that this is the difference between *Shan* and claim 15 that required the use of the secondary reference *Suntola*.

In the paragraph spanning pages 7 and 8 of the Office Action, the Examiner refers to “a first separating ring (76; Figure 3; column 9, lines 31-37).” This reference numeral is not in *Suntola*, although the Examiner is alleging that this is what “*Suntola* teaches.” The disclosure at column 9, lines 31-37 in *Suntola* does not describe any structure identifiable as a separating ring. So, obviously, *Suntola* does not teach “a first separating ring (76; Figure 3; column 9, lines 31-37).” A ring is labeled with reference numeral 76 in *Shan*. However, the disclosure at column 9, lines 31-37 in *Shan* does not contain any description that relates to the ring (76). Regardless, the ring 76 is taught by *Shan*, not by *Suntola*. The Examiner is randomly mixing disclosure from *Shan* and *Suntola* in the annotations for the paragraph spanning pages 7 and 8 of the Office Action and, even then, there are errors in the annotations.

In a paragraph on page 8 of the Office Action, the Examiner finally states that “Maher teaches a wafer plasma processing apparatus (Figure 4) including plural parallel electrodes 19a,b-25a,b each interposed between insulating dielectric layers 19c-25c.” This deviates dramatically from the Examiner’s overly detailed approach for identifying the

disclosure in *Shan* and *Suntola* with multiple annotations. Only with the benefit of the Examiner's statements on page 12 of the Office Action can the Applicants begin to understand that the Examiner believes that *Shan* fails to disclose "said third electrode" and that the Examiner is using Maher as a teaching of the "third electrode" absent from *Shan*.

A paragraph on page 8 of the Office Action clearing stating what the combination of *Shan* and *Suntola* fails to teach would be aid the Applicants to readily comprehend the differences that the Examiner believes exist between claim 15 and the combined disclosure of *Shan* and *Suntola*.

As another Example, the Examiner reproduces Applicants' claim 16 on page 6 of the Office Action and includes an annotation in parentheses following every noun with disclosure allegedly in *Shan*. However, on page 8 of the Office Action, the Examiner again reproduces Applicants' claim 16 with an annotation in parentheses following every noun with disclosure allegedly in *Suntola*. Again, the Examiner has replaced the term "electrode" with "chamber." Applicants are left to again speculate as to the difference between claim 16 and *Shan* that required the Examiner to even include the paragraph on page 8. If there are no differences, then Applicants can only speculate as to why the paragraph on page 8 of the Office Action is present.

The Examiner's remaining rejections under 35 U.S.C. § 103(a) suffer from the same or similar lack of clarity. Applicants do not have the benefit of any such explanation for the other rejected claims rejected under 35 U.S.C. § 103(a).

CONCLUSION

Applicants have made a bona fide effort to respond to each and every requirement set forth in the Office Action. In view of the foregoing amendments and remarks, this application is submitted to be in complete condition for allowance and, accordingly, a timely notice of allowance to this effect is earnestly solicited. In the event that any issues remain outstanding, the Examiner is invited to contact the undersigned to expedite issuance of this application.

Applicants do not believe fees are due in connection with filing this communication, other than an RCE fee. However, if such petition is due or any fees are necessary, the Commissioner may consider this to be a request for such and is hereby authorized

to charge any under-payment or fees associated with this communication, or to credit any over-payment, to Deposit Account No. 23-3000.

Respectfully submitted,
WOOD, HERRON & EVANS, L.L.P.

By: /William R. Allen/
William R. Allen, Ph.D.
Reg. No. 48,389

2700 Carew Tower
Cincinnati, Ohio 45202
(513) 241-2324 (voice)
(513) 241-6234 (facsimile)